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THE AMERICAN JOURNAL
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OPHTHALMOLOGY

VOL. XXXIII. FEBRUARY, 1916. No. 2

ORIGINAL ARTICLES.

EYE SPECULA: THREE NEW DESIGNS.*

By A. E. Ewing, M.D.,
ST. LOUIS, MO.

In the works on the surgery of the eye previous to 1854, and in many others to even a recent date, the diagrams of important operations on the globe show the lids held apart by the fingers. Also many of the authors do not hesitate in saying that this method of fixing the eyelids is preferred because of the lack of pressure on the globe, and the ease and the rapidity with which they may be released in case of serious complications. Probably the first instrument employed for holding the lids apart was the hook, resembling the ordinary strabismus hook but somewhat more curved (Pl. I, Fig. 1). This instrument is still employed in the eastern countries by those who know nothing of modern ophthalmology, and it is doubtless safe to assume that their operative procedures have undergone very little change for centuries. The illustration is a reproduction from the one in Hirschberg's *Geschichte der Augenheilkunde,* Vol. I, p. 208, 1905, where it is credited by him to Drake-Brockman. In the same volume, page 198, Hirschberg reproduces hooks from the work of Arab Halifa, 1266, which are assumed by him to be hooks for elevating the eyelids, and in *Graefe-Saemisch,* Vol. XIV, pp. 188-9, 2nd ed., he remarks that the hook was employed by the Greeks for this purpose, citing Aetius as his authority. This illustration from Drake-Brockman is also reproduced in Wood's *Ophthalmic Operations,* Vol. II, p. 1313.

In the latter half of the sixteenth century Ambroise Paré illus-

*Read before the Ophthalmic Section of the St. Louis Medical Society, December 1st, 1915.

trates an eye speculum (Pl. I, Fig. 2) which he employed to separate the eyelids for operative purposes. The lid elevators were nearly circular in form, having a break in the major axis of the circle on one side and on the other side they were attached to a handle (Ambroise Paré, *Oeuvres Complètes,* 1582, p. 305), (Hirschberg in Graefe-Saemisch, 2nd ed. Vol. XIV, p. 189). An instrument similar to this is that of Millar (Pl. I, Fig. 6, a, b), illustrated in *Bell's Surgery,* 1787, Vol. III, p. 244, plate XXX. The manner of its employment in the operation of couching cataract is described on p. 418 as follows: "The assistant is now to raise the upper eyelid with the fingers of his left hand; and the surgeon applying the groove in the upper part of the speculum, in such a manner that it may receive the edge of the eyelid, the opening or circle formed by the brim of the speculum is to be pressed upon the ball of the eye, till the transparent cornea, and nearly about an eighth part of an inch of the sclerotica, is protruded; by which means if a steady and equal pressure be continued upon the eye, it will be kept firmly fixed without any injury being done to it, at the same time that a sufficient quantity of the ball will be left uncovered by the speculum for the purpose of the operation." With regard to the value of the speculum, he says on page 416, "It is of much importance to have the eye properly fixed during the whole course of the operation, and as this cannot be done effectually in any other manner than with a speculum exactly fitted to the eye, every operator should be provided with several sizes of this instrument"; and on p. 436 in the chapter on cataract extraction, "when the lens is to be extracted from the left eye, the speculum must be applied in the manner we have formerly mentioned, and must be pressed upon the eye with the left hand of the operator with as much firmness as is necessary for securing the eye; but more than this should be avoided, as it not only gives more pain, but is apt to press the cornea into too near contact with the iris; by which the latter is in great risk of being injured in the subsequent steps of the operation." For the explanation of the break in the ring he says, p. 438, in cataract extraction, "We are advised indeed by some to remove the speculum altogether on the knife being passed out at the opposite side of the eye; and for this purpose an opening is left on one side of the instrument, to admit of its being taken off." (Pl. I, Fig. 6, b.) "But with an operator accustomed to the use of the speculum, there is no necessity for this precaution; for a degree of pressure may be continued with it sufficient for fix-

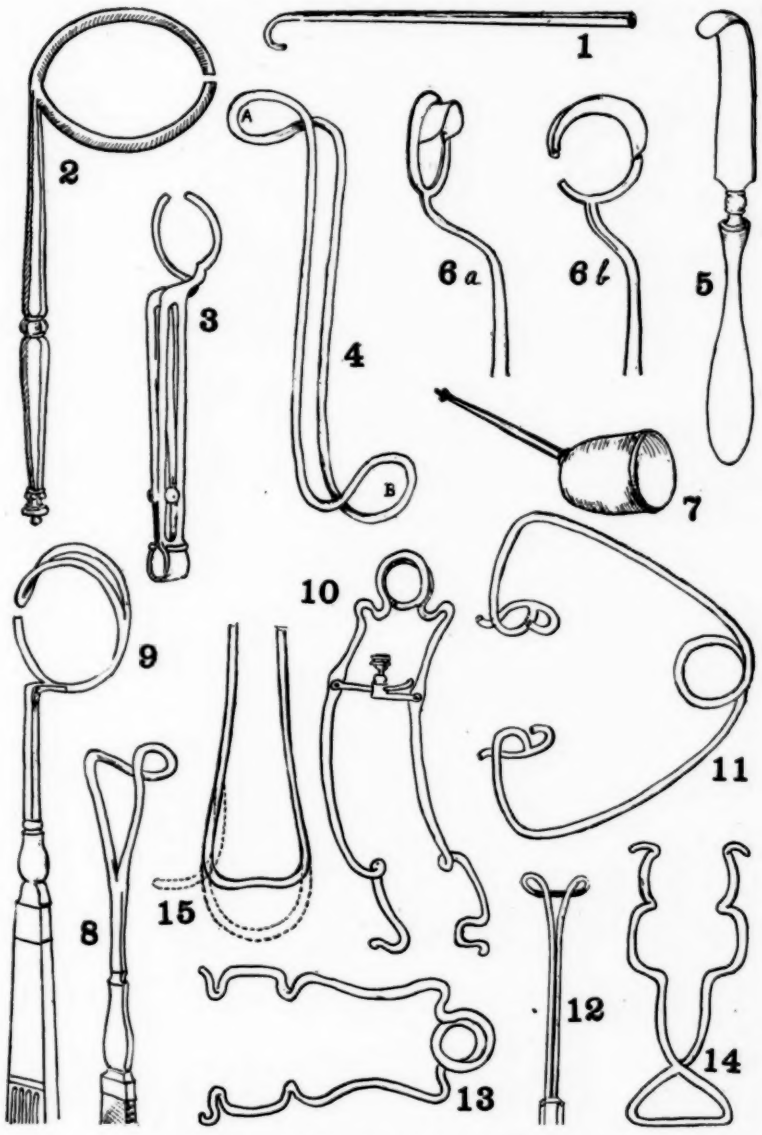

Plate I.—Eye Specula: Three New Designs.

Fig.
1. East Indian eyelid hook elevator.
2. Eye speculum of Ambroise Paré, 1582.
3. Eye speculum of Cheselden, 1727.
4. Eyelid elevator of Pellier, 1788.
5. Eyelid elevator of Bell, 1788.
6. a, b. Eye specula of Millar, 1788.
7. Eyelid thimble elevator of Rumpelt, 1805.
8. Eyelid elevator of Comperat, 1838.
9. Eye speculum of Lusardi, 1838.
10. Eye speculum of Kelley-Snowden, 1843 (?), 1874.
11. Eye speculum of Hayes, 1843.
12. Eyelid elevator of Walton, 1853.
13. Eye speculum of 1855.
14. Eye speculum of 1858.
15. Eyelid elevator of Saunders, showing the change made by him in the curve of the end of Pellier's elevator.

ing the eye, without any risk of forcing out the vitreous humor; and by keeping the eye fixed to the last, we are enabled to form the incision with more exactness than can possibly be done when the speculum is removed earlier in the operation."

From these various quotations it will be seen that these elliptical-like and round specula were employed not merely for fixing the lids but also for fixing the globe at the same time. Also it must be kept in mind that anæsthetics were then unknown.

A similar instrument is that of Lusardi (Pl. I, Fig. 9), illustrated by Carron du Villards, 1838, which has a projecting wire loop for holding the upper lid, instead of the continuous plate. One like this is described by Ware, 1805, Vol. I, p. 85, but credited to "Mr. Else". The blade for holding the upper lid being located on the circle at the end of these instruments, the opening being at the side as described by Bell, and the curve of the handles, indicate that they were operated from below.

In Fig. 12 of the plate contained in Vol. I, Ware illustrates the thimble elevator of Rumpelt (Pl. I, Fig. 7), which was worn on the middle finger of the operator, while the other fingers were left free for controlling the lower lid and the globe. He does not describe but mentions specula invented by "Beranger, Guerin, Pope, Petit, Le Cat, and many others." A number are described in *Encyclopaedisches Wörterbuch der Medicinischen Wissenschaften,* 1843, Vol. IV, under the titles Augenhalter and Augenlidhalter.

In the chapters on the eye in his work on surgery, Bell mentions two other instruments of interest, one "a flat curved hook" (Pl. I. Fig. 5) for elevating inflamed upper lids to remove foreign bodies, while the lower lid is depressed by the fingers (Bell, *A System of Surgery,* Vol. III, p. 238, Pl. XXIX, 1788). This was also used in enucleation of the eye, one for the upper and one for the lower lid (ib. p. 388). This flat hook is the forerunner of Desmarre's lid elevator. The other, of special interest, is the curved wire elevator of Pellier (Pl. I, Fig. 4), (ib. Vol. IV, p. 21, Pl. XXXIX). His description of the instrument and of Pellier's manner of employing it in the extraction of cataract is as follows: "It is made of wire; and it may either be of gold, silver, or any other metal. The head being fixed by pressing it against the breast with one hand under the chin, the assistant takes this instrument in the other; and placing the round curvature A upon the upper eyelid immediately behind the tarsus or cartilage, he must by gentle gradual pressure fix the

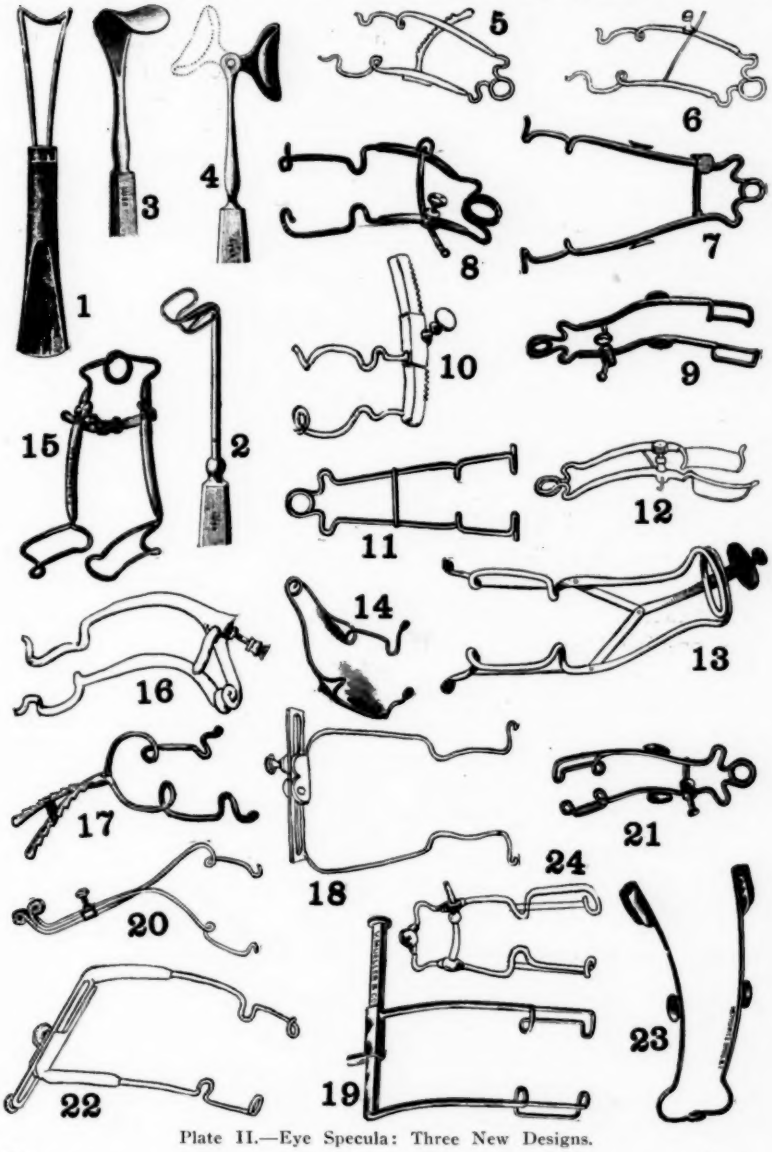

Plate II.—Eye Specula: Three New Designs.

Fig.
1. Eyelid elevator of Jaeger.
2. Eyelid elevator of Noyes (1).
3. Eyelid elevator of Desmarres.
4. Eyelid elevator of Abadie.
5. Eye speculum of Bowman, 1864.
6. Eye speculum of Bader, 1864.
7. Eye speculum of Graefe.
8. Eye speculum of Critchett.
9. Eye speculum of Weber.
10. Eye speculum of Noyes, nasal side (2), 1875.
11. Eye speculum of Noyes (3).
12. Eye speculum of Laurence, 1869.
13. Eye speculum of Noyes (4), 1869.
14. Eye speculum of Hart.

Fig.
15. Eye speculum of Critchett, nasal side.
16. Eye speculum of Foveaux. 1869.
17. Eye speculum of Schwatka.
18. Eye speculum of Murdoch (1) 1874.
19. Eye speculum of Murdoch (2) 1883.
20. Eye speculum of Leibold.
21. Eye speculum of Hirschberg.
22. Eye speculum of Friedenwald, 1876.
23. Eye speculum of Stevens.
24. Eye speculum of Randolph.

eye above, while the operator with the fore and middle fingers of his left hand, when the operation is to be done upon the left eye, must fix it below, at the same time that he draws down the under eyelid. In using this instrument the upper eyelid is forced almost entirely into the orbit, but it immediately returns to its natural situation on the instrument being withdrawn."

This instrument is the ordinary wire lid elevator of the present day, which has the elevators at either end of the handle, one curved in the opposite direction from the other. Saunders, 1811, modified the hook by making a depression at the center of the curved portion corresponding to the center of the lid (Pl. I, Fig. 15). He also made the hook of one end smaller than that of the other in order to adapt the instrument to the eye of a child or of an adult. Later it was further modified by Jaeger by employing only one of the hooks on one end and his lid spatula on the other end of a handle. This is known as Jaeger's lid elevator, (Pl. II, Fig. 1). Carron du Villards, 1838, illustrates the lid elevator of Comperat, in which the change from the Pellier form consists in reuniting the ends of the wire after the hook has been formed and inserting them in a handle (Pl. I, Fig. 8), such as is used for knives, hooks and other eye instruments. The modern form (Pl. I, Fig. 12) is shown in Walton, Am. Ed., 1853, and in Mackenzie, 1854. Beer, 1817, Weller, 1823, and Tyrrell, 1840, each illustrate the Pellier elevator, but attribute it to Richter. Noyes, 1874, modified the hook blade by adding a second wire near the handle (Pl. II, Fig. 2) so as to firmly engage the tarsal margin of the lid and tuck the lid back under the margin of the orbit in eyes that were deeply sunken. Hess has added a second blade parallel with the first so arranged that it will press against the principal blade for the purpose of holding oiled silk or gutta percha tissue (Pl. V, Fig. 1). Nicati omits the loop, employing only two separated hooks on the same handle (Pl. V, Fig. 2). Callan, Motais, Fage and Edgar Browne have arranged it for irrigating the conjunctival sac (Pl. V, Figs, 6, 12, 14, 15). Other modern forms of this instrument are those of Stevenson, Baxter, Moraweck and Fisher.

The flat curved continuous plate form of blade, Bell's "flat curved hook," was modernized by Desmarres to the form that bears his name (Pl. II, Fig. 3), which is still an ideal instrument. Abadie had the blade pivoted to the handle (Pl. II, Fig. 4) so the instrument could be operated from above or from the side (*Encyclopedie Francaise d'Ophtalmologie,* Vol. IX, p. 35).

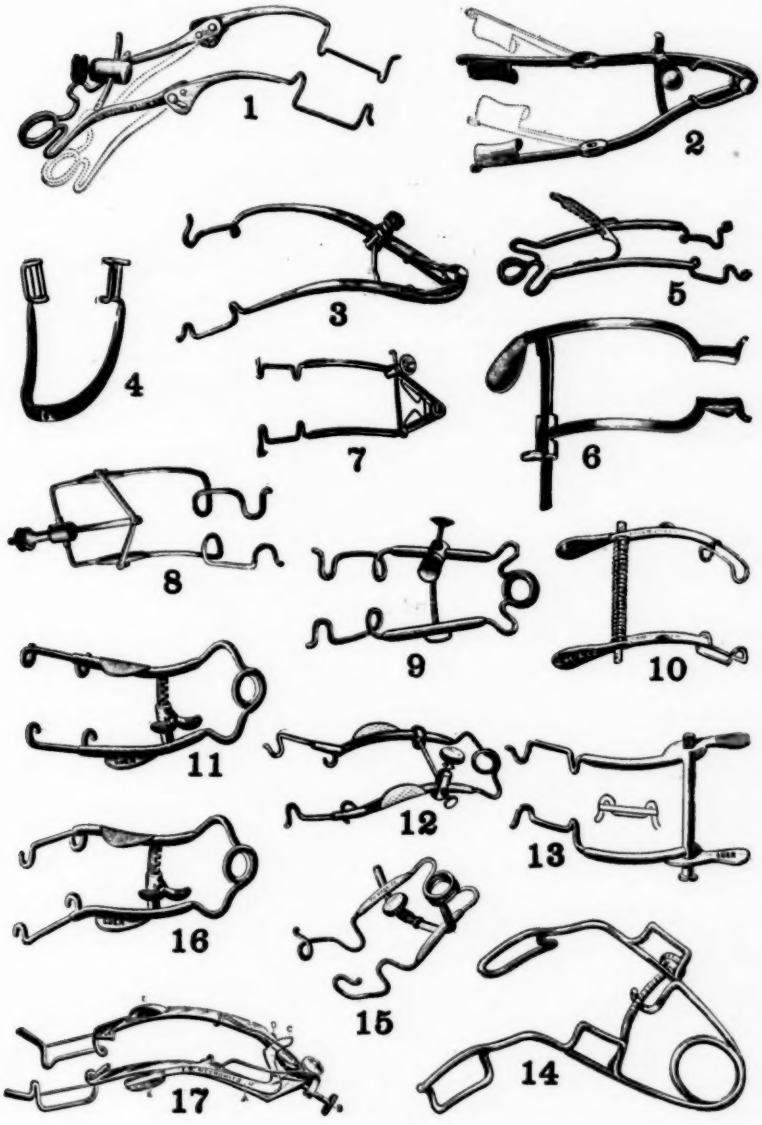

Plate III.—Eye Specula: Three New Designs.

Fig.
1. Eye speculum of Galezowski.
2. Eye speculum of Panas, 1894.
3. Eye speculum of Knapp.
4. Eye speculum of Greven.
5. Eye speculum of Schweigger.
6. Eye speculum of Monosmith.
7. Eye speculum of Fox.
8. Eye speculum of Galante.
9. Eye speculum of De Wecker.
10. Eye speculum of Mellinger (1)
11. Eye speculum of Landolt (2), 1885.
12. Eye speculum of Landolt (1)
13. Eye speculum of Mellinger (2)
14. Eye speculum of Koster.
15. Eye speculum of Liebreich.
16. Eye speculum of Landolt (3). nasal side.
17. Eye speculum of Skeel.

Ziegler has broadened the blade, Chibret has made it narrower, and it has been arranged by La Grange, Terson and Wieden so as to be used for irrigating the retrotarsal fold (Pl. V, Figs. 7, 11, 10, 13, 16).

In the employment of the preceding forms of instruments the lids are controlled by holding the instruments in the hand. An exception is the hook devised by Swazy (Pl. VI, Fig. 8), which is unique in that the hook is attached to a chain and this chain is suspended from a band that is fixed to the forehead. The links of the chain catch on a pin that projects from the band and the hook is raised or lowered by means of the links (*Jour. Am. Med. Ass.*, November 16, 1907), (*Am. Encyclopedia of Ophthalmology*, Vol. III, p. 1658).

The first self-retaining speculum illustrated in the literature is that of Cheselden, 1727 (Pl. I, Fig. 3). Its blades are halves of a circle somewhat flattened on each side. The limbs of the handle are united by a spring and each limb contains a slot. A set screw or a travelling guard works in this slot connecting the limbs and permitting the blades to be opened and fixed at any desirable distance. This instrument was evidently widely employed, for in his criticism of it as compared with Millar's (Pl. I, Fig. 6, a, b) mentioned above, Bell says, Vol. 3, p. 428: "It has been commonly objected to the use of a speculum, that it does not secure the eye sufficiently; and that it always proves detrimental, by exciting inflammation over the eyeball. This observation, I believe, is very well founded with respect to the instrument in ordinary use, of which a delineation is given in Fig. 4, Pl. XXXI. But it does not apply to the other (that of Millar), which, when properly fitted to the size of the eye secures it exactly; and when finely polished, it is never productive of any inconvenience."

Although this is the prototype in a general way of the self-retaining speculum, many changes have taken place in its construction in order to adapt it to modern surgery. The present day type occurs in two distinct forms, one that is maintained in position by friction, and the other by a spring. The last (Pl. I, Fig. 11) is illustrated and the first is described in Isaac Hays' American edition of *Lawrence on the Eye*, 1843, p. 731, as follows: "When the assistant cannot be depended on, the lids may be separated by a speculum; and the best for this purpose we have seen is the elastic steel-wire speculum, represented in the accompanying figure. The two branches are to be pressed together, one end introduced under the upper and the other under the

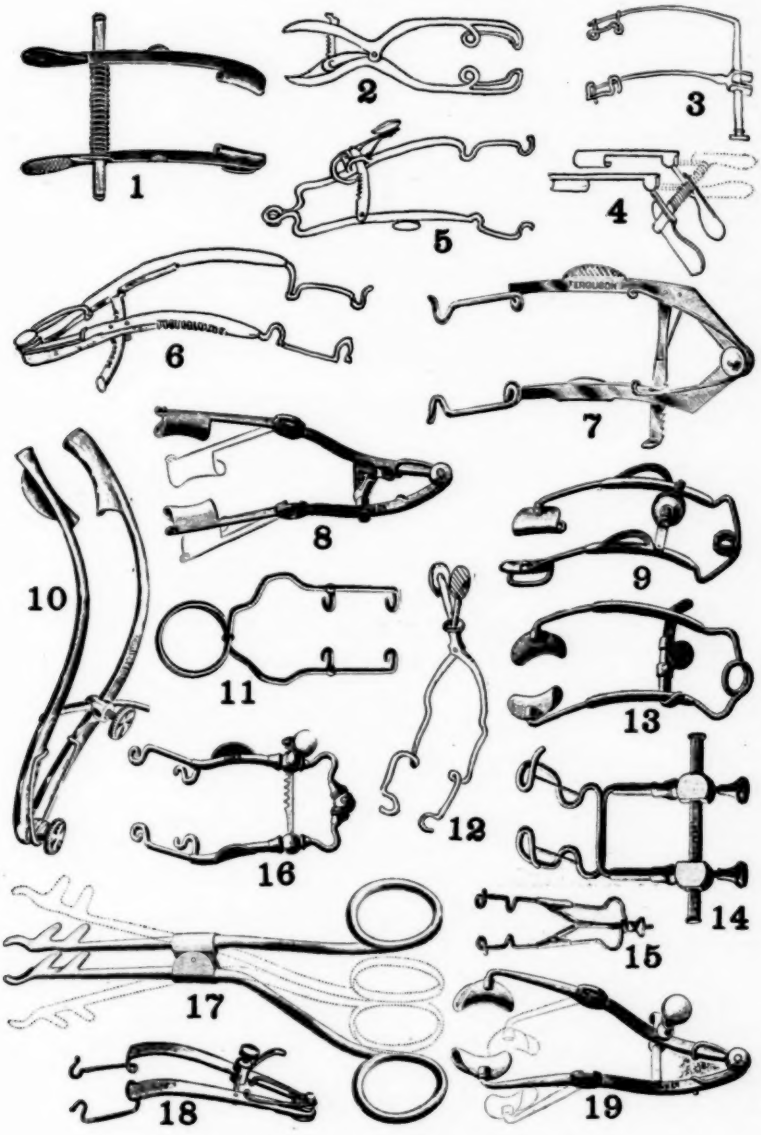

Plate IV.—Eye Specula: Three New Designs.

Fig.
1. Eye speculum of Beard, 1905.
2. Eye speculum of Schmidt-Rimpler (1), 1889.
3. Eye speculum of Schmidt-Rimpler (2).
4. Eye speculum of Stevenson, 1904.
5. Eye speculum of Schwarz.
6. Eye speculum of Bishop, 1906.
7. Eye speculum of Shoemaker, 1909.
8. Eye speculum of Menacho, 1886.
9. Eye speculum of Pley, 1907.

Fig.
10. Eye speculum of Lang.
11. Eye speculum of Nicati
12. Eye speculum of Mittendorf, 1902.
13. Eye speculum of Vacher.
14. Eye speculum of Coppez.
15. Eye speculum of Bowman.
16. Eye speculum of Duboys.
17. Eye speculum of Pedrazzoli, 1902.
18. Eye speculum of Payne.
19. Eye speculum of Gaupillat.

lower lid; the force of the spring then separates the lids. An instrument, which also answers, has been devised by Drs. P. B. Goddard and W. W. Ruschenberger. It is made of silver wire, somewhat similar in form to that just figured, but it is constructed in two separate pieces, to one of which is attached a cylinder, and to the other a rod which slides in the former. When this instrument is applied, and the branches separated, the friction of the rod against the cylinder will effectually resist any effort of the patient to close the lids."

Another spring speculum of this date is pictured as it was employed in the eye for the operation of strabismus, in Bernard and Huette, *Medicine Operatoire Atlas,* Pl. 40, Fig. 4, 1853-4. It is called a *blepharectome;* but the design which is here reproduced in half-tone, Fig. 1, and also another delineation of the instrument, *Atlas,* Pl. 9, Fig. 29, indicate that its only purpose was to separate the lids for operative procedures.

Fig. 1.

The pure types of these forms in common use at the present time are the plain spring speculum (Pl. I, Fig. 13), which was employed by Critchett in 1855 (Hirschberg, in Graefe-Saemisch, Vol. XIV, abth. IV, S. 189), and the well known friction, or bar and canula speculum of Murdoch (Pl. II, Fig. 19) (*Trans. Am. Ophth. Socy.,* 1883, p. 467). From these two types a great number of combinations have arisen, with a variety of ratchets, set-screws, rings, loops and triggers to aid in the ease of introduction and in the rapidity of removal, the most common form of the spring types being a continuous spring with a crossbar and a set-screw attachment, or a form in which the arms of the elevators are united by a pivot and opened by a small spring in the angle, the action of the spring being under the control of a crossbar and a set-screw. (See accompanying plates.)

An addition to the friction, or bar and canula form of the speculum, is the placing of a coil spring about the bar to aid in introducing the instrument (Pl. III, Fig. 10), and another change is in having in one of the bars a slot, in which a set-screw on the fellow bar plays, thus permitting the opening or the closing of the instrument and the fixing of the bars at any point. These forms are illustrated, the one (Pl. II, Fig. 18) by Dr. Murdoch (*Trans. Am. Oph. Soc.,* 1874, p. 211), and the other (Pl. II, Fig.

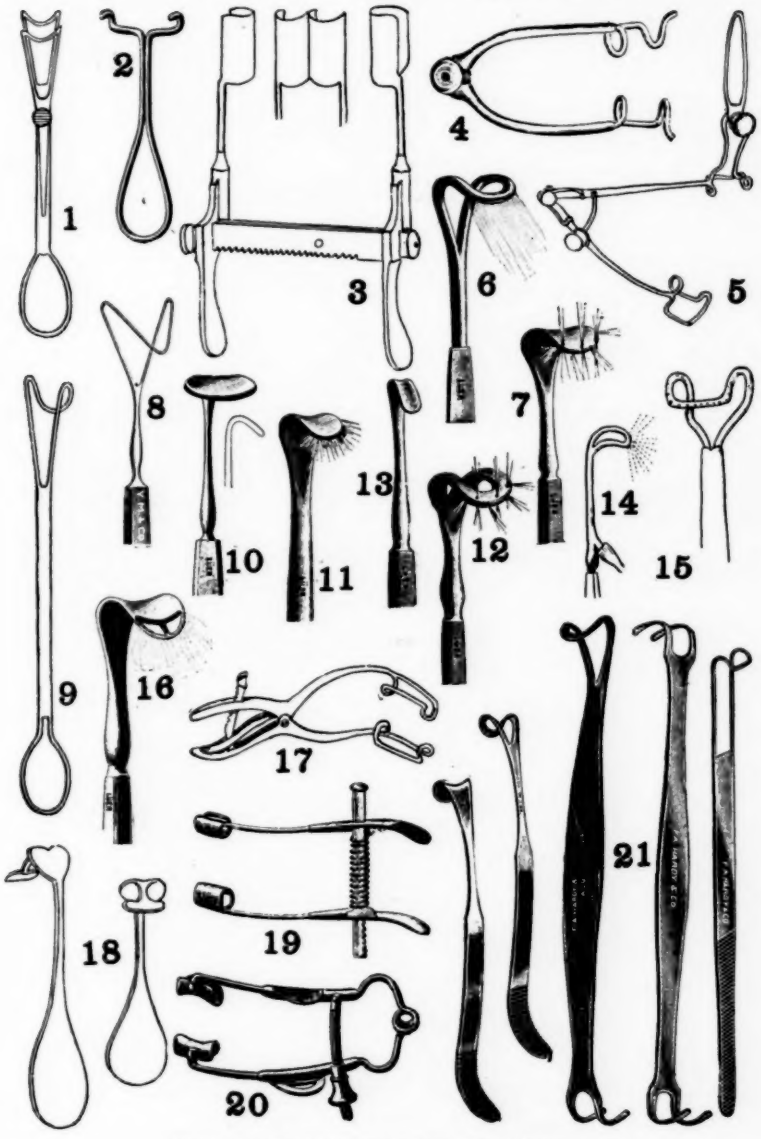

Plate V.—Eye Specula: Three New Designs.

Fig.
1. Eyelid elevator of Hess.
2. Eyelid elevator of Nicati.
3. Eye speculum of Mueller, 1905.
4. Eye speculum with concealed spring.
5. Eye speculum of Zimmermann, 1911.
6. Eyelid elevator of Fage.
7. Eyelid elevator of La Grange.
8. Eyelid elevator of Stevenson.
9. Eyelid elevator of Moraweck.
10. Eyelid elevator of Ziegler.
11. Eyelid elevator of Terson.

Fig.
12. Eyelid elevator of Motais.
13. Eyelid elevator of Chibret (for infants).
14. Eyelid elevator of Callan.
15. Eyelid elevator of Edgar Browne.
16. Eyelid elevator of Wieden.
17. Eye speculum of Chisholm.
18. Eyelid elevators of Vail, 1915.
19. Eye speculum of Morax.
20. Eye speculum of Terson.
21. Eyelid elevators, 5, of Fisher, 1914.

22), was an invention of Dr. Aaron Friedenwald about forty years ago, but never described by him. I am indebted to his son, Dr. Harry Friedenwald, for the privilege of including it among these drawings. It is the only form that I have been able to find that actually drops apart on the release of the set-screw, so that one blade may be removed without disturbing the fellow blade. Green has added a handle to the second Murdoch speculum in order that it may be operated by an assistant (*Ophthalmic Record,* Vol. XXIV, p. 67), (Pl. VI, Fig. 10).

As a rule the surgeons prefer to operate the speculum from the temporal side, but some prefer to employ it from the nasal side, and many specula are arranged for insertion from the nasal side. I have not been successful in tracing the source of this innovation.

There is a great variation in the size and shape of the arms that support the blades, some being thick and heavy, others thin and light, and they may be round, square or flat. The speculum of Panas (Panas, 1894), (Pl. III, Fig. 1) shows a knee-joint-like arrangement near the center of the arms for accommodating the instrument to the outer orbital margin. In 1904 Stevenson devised a similar arrangement for the Mellinger speculum (*Ophthalmic Record,* April, 1904), (Pl. IV, Fig. 4).

While blades have in common practically the same curve, they vary in that some consist of two hooks, as those of Landolt and Nicati, which are new forms of the elevator employed by Daviel (*Encyclopädisches Wörterbuch der Medicinischen Wissenschaften,* Vol. IV, p. 227); some consist of the curved wire loop, as that of Pellier and most modern specula; some have the fenestrated form, which is the wire loop with a second wire bridging the opening for the purpose of engaging the cilia, and some consist of a continuous curved plate of metal or horn, as that of Desmarres. Laurence seems to have been the first to adapt this plate to the modern form of the self-retaining spring speculum (Laurence, *A Handy Book of Ophthalmic Surgery,* p. 39). The advantages claimed for this form of blade are that it engages the lashes and protects the wound against the secretions from the lid margin. Beard prefers to have the hook of the plate shorter than most operators to avoid irritating the retrotarsal fold. Koster employs the fenestrated form and gradually widens the hook to the temporal side. This aids in keeping the lids widely separated at the outer angle. In some specula the blade is attached to the arm by a pivot in such a way that it will have a swivel action. In the speculum devised by him, Landolt

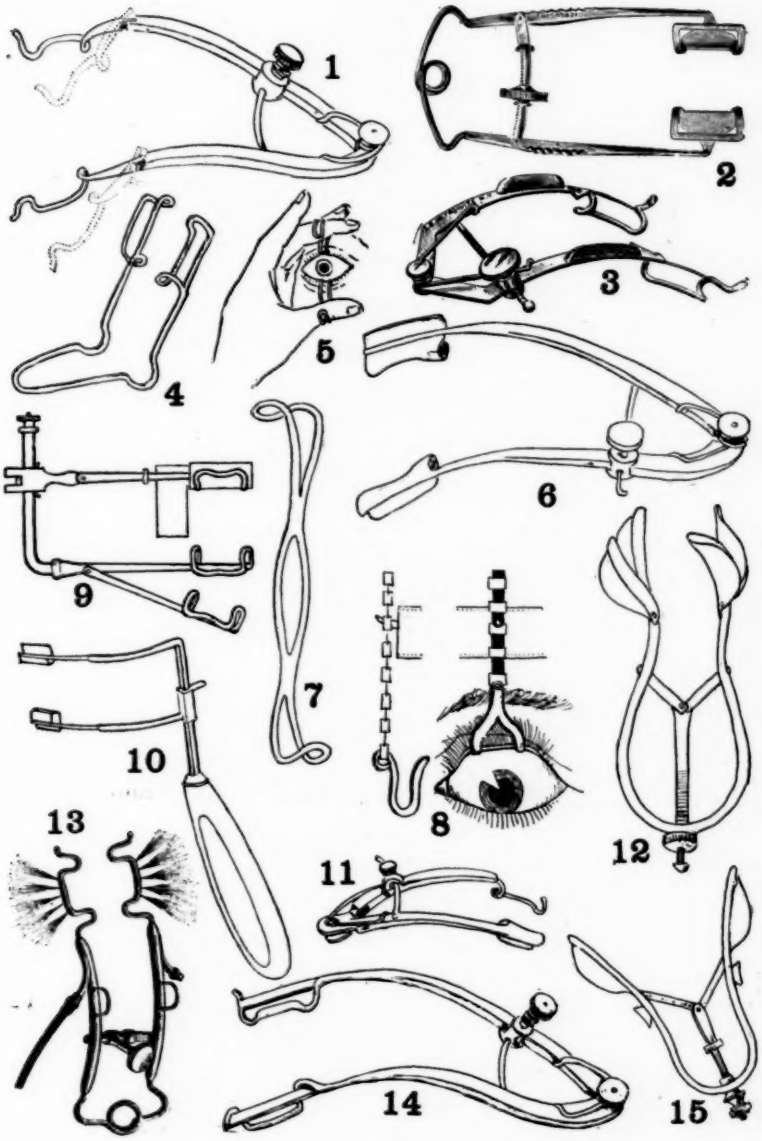

Plate VI.—Eye Specula: Three New Designs.

Fig.
1. Eye speculum of Webster Fox.
2. Eye speculum of Ziegler.
3. Eye speculum of Weeks.
4. Eye speculum of Greene.
5. Eyelid elevators of McGillvray.
6. Eye speculum of Lang (for redundant upper lids).
7. Eyelid elevator of Rowan.
8. Eyelid elevator of Swazey, 1907.
9. Eye speculum of Emanuel, 1906.
10. Eye speculum of Green, 1915.
11. Eye speculum of Stroschein.
12. Eye speculum of Beebe.
13. Eye speculum, irrigating.
14. Eye speculum of Williams.
15. Eye speculum of Wild.

arranged the hooks of the one blade so they will pass the hooks of the other when the instrument is closed, the purpose being to aid in the ease of its introduction between the lids (*Archives d'Ophtalmologie,* Vol. V, p. 53). Mueller has adjusted the blades so they will automatically rotate from beneath the lids as the speculum is withdrawn (Pl. V, Fig. 3), (*Klin. Monats. für Augenheilk.,* Vol. XLIII, abth. 2, S. 266). For the purpose of securing better antisepsis a second blade to clamp a bit of sterilized fabric to the principal blade has been added by Emanuel (Pl. VI, Fig. 9), (*Klin. Monatsb. für Augenheilk.,* Vol. XLV, S. 567). A recent innovation is the construction of the blades from small tubing, in which are minute openings for irrigating the conjunctival sac while the speculum is in position.

The great number of instruments for holding the lids apart for operative procedures illustrated in the accompanying plates is the evidence that the ideal lid elevator has not yet been discovered. Previous to the introduction of the local anæsthetic, cocaine, by Koller, the control and release of the lids was of the greatest importance in nervous and unruly patients, and up to that date most of the books show the lids held by fingers for such hazardous operations as cataract. For other operations, as for pterygium and strabismus, the speculum was employed. Since the relieving of the tension of the patient by means of an anæsthetic to the lids nearly all the books show the lids held apart by some form of self-retaining speculum in operations requiring the separation of the lids.

To me the bar types are objectionable because of the difficulty of their introduction as well as removal, and the spring types because of the necessity of pulling down the lower lid or raising the upper lid in order to remove them. For a number of years I have relied mainly on the fingers of an expert assistant for all dangerous operations on the globe. Lately this expert help failed me and prompted the invention of the following three new designs of specula, or rather the first design led to the second and the second to the third in the order of their description.

In the first design, the plan was to manipulate the elevators from a thin metal plate, or a large aluminum wire, (a) standard gauge 30, flattened on the side next to the face and curved in the form shown in Pl. VII, Fig. A. To each end was riveted a carrier containing a groove (c) and set-screw (d). The handles (h) of the elevators (e) were placed at right angles to the arms of the elevator and were constructed so as to glide snugly but freely in the grooves of the carriers. The set-screws were ar-

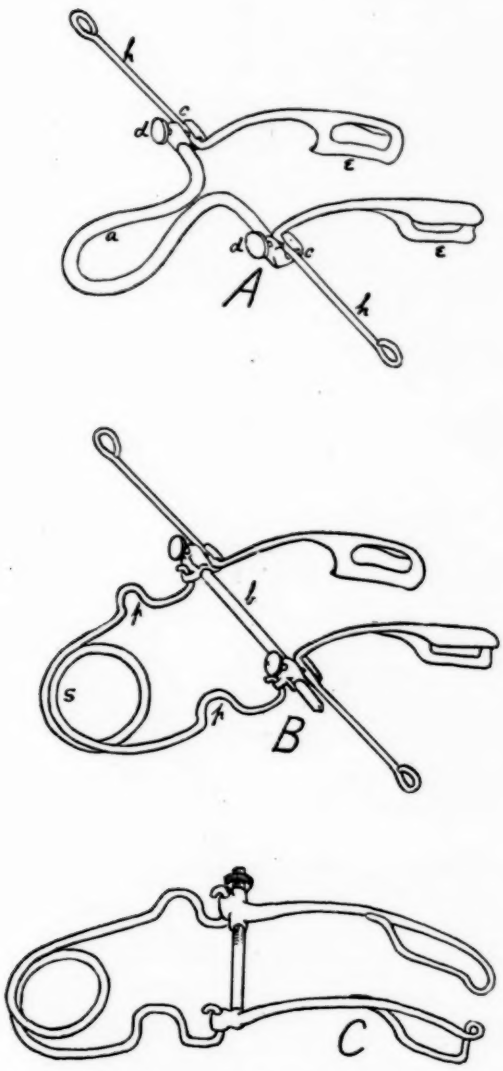

Plate VII.—Eye Specula: Three New Designs.

Fig. A. Eye speculum to be held on temple by adhesive plaster, arms of the blades controlled by set-screws.

Fig. B. Eye speculum: spring and friction types combined; arms of the blades controlled by set-screws.

Fig. C. Eye speculum: spring and friction types combined.

ranged to clamp the handles toward the front in order that the handles might be made to move easily in the grooves when not firmly fixed by the set-screws, as this aided both in adjusting the blades and also in sterilizing the instrument. The aluminum wire was fastened to the temple of the patient by adhesive plaster, or held by a nurse or an assistant, and the elevators were then adjusted to the eye. This instrument was employed in several cataract operations successfully but not satisfactorily, because of the inability to introduce the two blades at the same time. To obviate this defect the design in Plate VII, Fig. B, was devised. This consists of a combination of the spring and friction types of specula. It is constructed by hinging a spring (s) to the carriers represented in Fig. A. One of the carriers is then fixed to one end of a bar (b), the other end of which is arranged to glide freely but snugly through a tube or canula in the fellow carrier. Very near the carriers, hand holds (h) are placed in the ends of the spring. When the elevators are fixed in position by the set-screws as widely apart as may be required they may be brought together by moderate pressure on the spring at the hand holds. After introduction between the eyelids the spring is released and the speculum is in place. Its removal may be effected in two ways. The blades may instantly be brought together by pressure on the spring at the hand holds near the bar, and the removal effected in the usual manner, or the set screw of the upper lid blade may be released and this blade may be easily slipped from beneath the lid, and at the same time it may be kept away from the wound by lifting the lid a little forward with it as it is withdrawn. This last is to me the method most preferred.

In the third design (Pl. VII, C), the handles, set-screws and grooves are omitted, and the arms bearing the blades are connected directly to the spring by the hinge. The instrument is inserted and removed in the same manner as any other spring speculum. At the suggestion of Dr. W. A. Shoemaker I have added a check in the form of a nut to the free end of the bar in this design to control the width to which the arms may open. If the spring is weak, as it should be, this is an unnecessary addition, but it is a protection in the case of a strong spring. It is an excellent instrument for all operations, but for cataract operations, or for any operation in which the globe is to be incised to any extent, I prefer the one just preceding. The action of each of these last two instruments is the same as in the Mellinger or the Beard speculum, but there is no coil spring to become stiff

as the instrument is closed or to prevent the near approach of the blades in closing it.

Either of the three designs may be constructed wholly of German silver. For the spring standard gauge 56, for the arms 51, for the cross bar 49, German silver wire is employed, and the blades are of sheet German silver 1/32 of an inch in thickness. The weight of B is 156 grains and that of C is 73 grains. The width of the blade which passes beneath the lid is 12 mm., but it gradually increases in width to the temporal side to 22 mm. at its attachment to the arm. The depth of the groove is 5 mm., its width is 4.5 mm. The length of the arm and the blade combined is 37 mm. The length of the spring when the blades are closed is 38 mm., the size of the coil is 20 mm. The hand hold is 6 mm. in height and 9 mm. wide at the base. The carrier is 5.5 mm. wide, 3 mm. thick and 6 mm. long; this does not include the small projections for the set-screw and for the hinge, both of which should be made as small and as light as possible. The blades are moderately curved to accommodate the curve of the lid margin. Any form of blade may be employed with either of the designs, but the one from the above measurements, which is represented in designs A and B, has given the greatest satisfaction in my own work.

While investigating the subject of eyelid elevators and eyelid specula for the purpose of determining whether the new forms that accompany this article had not previously been described, I collected a great number of diagrams of instruments that have been employed for holding the eyelids open for surgical operations. As I can find no mention of such a collection, they are included with this article, because the instruments which they represent are the product of the thought and the skill of many of the master minds in ophthalmic surgery. So far as possible from the books at hand they have been reproduced from the original drawings in the older works on ophthalmology. The modern forms have been taken from the instrument catalogues of Luer, Weiss, Tiemann, Pilling, Kny-Scherer, V. Mueller, Sharp and Smith, Meyrowitz and Ferguson. Descriptions of the instruments have been omitted because the mechanism is much more readily comprehended by investigating the diagrams. Each diagram is numbered, and at the bottom of the plates the names of the inventors will be found, together with the date of the invention, or the period when the instrument was in use, when such date could be traced.

RUPTURE OF BOTH EYEBALLS. STUDY OF THE MECHANISM OF THIS LESION.*

By M. Landolt.

Among the great variety of injuries to which the eyeball may be exposed an accidental reunion of circumstances sometimes associates a violent shock produced by a body of relatively considerable weight with a relatively small point of contact.

It is convenient to separate these cases from those in which the contusing body is of smaller volume. The consequences are not the same, and I think I may explain this difference by designating these latter cases by the word *contusion,* and those which we shall consider by the name of *brusk compression.*

In considering these two most frequent types in our daily practice in times of peace, the first is represented by soda water or champagne corks, the second by the horn of the cow, and to this we must now add the rifle bullet. In this case the volume is smaller, but the velocity greater.

Which lesions are observed in brusk compression, when it is of sufficient intensity?

This accident causes a more or less complete and a more or less extensive rupture of the membranes of the eye with varying extrusion of its contents. The subconjunctival dislocation of the crystalline lens, especially, is a very frequent result of this accident. The photograph, being shown around, is one of a case of this kind, in one of my old patients. The case is a perfectly typical one on account of the site of the dislocation, upwards, and on account of the age of the patient. There is a certain fragility of the tissues necessary and the lesion is not always the same in younger individuals.

Although the degree and situation of the rupture may vary, one thing is constant, namely, the region which suffers

The wound is always 1 to 2 mllm. from the cornea, this means at a point which in the depth corresponds with the angle between iris and cornea, with the angle of the interior chamber at the level of the canal of Schlemm. This canal cannot be found in the sections of an eye thus injured, or when it can be found it is torn by the injury.

The rupture is indirect and is found at a point of the limbus opposite the point of contact of the contusing body. This at once explains why it lies most often up- and inwards, because

*Archives d'Ophtalmologie. November and December, 1915, p. 817.

the eyeball is less protected by bones down- and outwards than by the superciliary ridge and by the nose. However, some ruptures of the same character have been seen to lie at all the points of the circumference of the limbus.

The theories put forward regarding the mechanism of the rupture are, to say the least, very numerous. Let us cite a few of them in short.

At first the direct action of the sharp edge of the superior orbital margin was accused (Zander and Geissler). This cannot be correct because ruptures occur, for instance, inwards and outwards.

Another author (Arlt) thought that the rupture took place along the equator perpendicularly to the direction of the shock. According to him by reflex motion the eyeball is turned upwards as it does when the lids are closed, so that this equator goes through the limbus.

Three points refute this theory. In the first place it does not fit the inferior and lateral ruptures. Then, it neglects one in my mind important factor, the instantaneousness of the shock. Finally, an elastic membrane containing fluid, compressed between two opposite poles, does not tear along the equator or a parallel line, but along a meridian. The observation can easily be reproduced with an orange; the result is not dependent on the internal architecture and it is the same whether the compression is slow or brusk.

Another author (Hughes) supported by schematic drawings thinks that in its progress the contusing body raises a fold which finally coincides with the angle of the anterior chamber, the locus of least resistance, and causes the rupture.

I do not know, whether a cow's horn, be its point ever so sharp, can depress to such an extent an eyeball which in comparison is of such relatively small dimensions. Furthermore, it would be as with a green stick fracture, that the outermost layers would rupture first. I possess sections of eyes uncompletely ruptured in which Descemet's membrane is broken and the eyeball not opened. Three or four similar observations have been reported by other authors (Fuchs, Schaefer, Wintersteiner).

Some have even tried to attribute an active role to the propulsion of the aqueous humor, assuming that it would dislocate the trabecular tissue and tear the membranes (Sachs). It may be sufficient to recall that the same mechanism has been adduced to explain two other very different lesions. The aqueous humor

presses on the iris in the parts where this membrane is not supported by the lens, that is, its periphery. Of the two, one is, that the iris, because it is very thin at this point, gives way and an iridodialysis results, while in the other the iris is not ruptured; it is then folded back behind the crystalline lens and there will result a subluxation or a dislocation of the lens into the anterior chamber, a regular paraphimosis of the lens.

The comparative frequency of the subconjunctival dislocation of the lens might make us think that this organ takes an active part in the rupture, but the dislocation is very far from being the rule and this theory falls to the ground.

From all this, the fact remains that we deal with a little problem which has as yet not been definitely settled. We must, therefore, change the premises and it is that which an accident has done for me, and has permitted me to observe two cases of a very different kind.

In the first case the trauma may be the same, but strike eyes of an abnormal structure; in the second place healthy eyes may become subject to a trauma of exceptional character.

At the National Institute of Young Blind People I have seen and studied a certain number of traumatic ruptures in eyes suffering from congenital hydrophthalmus. This happens frequently among these children who in spite of their infirmity are often very wild and may strike against a piece of furniture, a half-opened door, or even, as that has happened, may fight with each other.

When we compare a normal and a hydrophthalmic eye, in the latter a traumatic rupture no longer lies at the level of the iris angle, but considerably further forwards, in that intercolated region in which the shell of the eye is the thinnest.

During the war I have found a case in which an eye, grazed by a ball in the equatorial region, ruptured at the place of selection in a perfectly classical manner.

It concerned a sergeant who had been shot through the anterior part of the cranium. The ball had entered nearly at the level of and in front of the temporal end of one brow and come out nearly at the level of the temporal end of the other brow. The eyeballs were widely opened and, so to speak, perfectly emptied by an expulsive hæmorrhage. As is unfortunately so often the case, I had to be satisfied to free the patient of these painful portions of useless organs. During their removal brain tissue oozed into the orbit on both sides. However, the patient is

doing very well. I saw him last about 2½ months after the injury.

Both eyes present a rupture at the iris angle. One is of small extent, the other on the contrary occupies four-fifths of the circumference. These lesions are not directly due to the ball, but are indirect ruptures produced by the brusk compression exercised by the projectile during its passage through the upper parts of the orbit.

The mechanism is a considerable and instantaneous hypertension which stretches the membranes and makes them rupture at the point where the shell is weakest, just where the trabecular tissue and Schlemm's canal reduce the thickness of the sclerotic about one-half.

A METHOD OF TREATING GONORRHŒAL OPHTHALMIA.

Barnert (*Medical Record,* February 5, 1916), after five or six years of experience with cresatin, a synthetic compound akin to the phenols and cresols, is of the opinion that the results achieved has been prompt and decided, efficient and non-hazardous. Cresatin has powerful germicidal properties and is free from the corrosive and destructive action of the ordinary phenols. It possesses, however, their marked analgesic action. Barnert first used the drug in the treatment of corneal ulcers and was impressed with the rapidity of healing of these lesions. This led to a trial in ophthalmia neonatorum, the duration of which under this mode of treatment is 24 to 48 hours after the first application. In most cases but one application was necessary and in none more than two. Gonococci are rarely found after the first application. After treatment consists of a weak zinc solution. A 25 per cent. solution of cresatin in albolene was regularly employed in prophylactic work, whereas the pure drug is used in fully developed ophthalmia neonatorum. The conjunctival sac is cleared of secretion by boric acid solution, holocain or cocaine instilled, and after a wait of a few moments a drop of cresatin on a cotton mounted tooth pick is applied to the mucosa of the conjunctival sac. It is necessary to cover the entire surface of the mucous membrane in this application. No force is used and the cornea must be protected from injury. Five case reports said to be typical are given.

THE SO-CALLED PRIMARY TUBERCULOSIS OF THE CONJUNCTIVA AND THE CONJUNCTIVAL TUBERCULOSIS OF LUPUS PATIENTS*

By Dr. K. K. K. Lundsgaard,

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In order to study the origin of conjunctival tuberculosis some authors have made statistical compilations, but, as far as I know, they have counted the cases of tuberculosis in lupus patients with those of so-called primary conjunctival tuberculosis. As to the name "primary" conjunctival tuberculosis, I want to point out that in Axenfeld's opinion not a few of these cases of conjunctival tuberculosis are hæmatogenous and, although the usual opinion is that lupus of the conjunctiva is a secondary affection, and we must assume an ectogenous infection of the conjunctival sac with the fingers, Axenfeld states that these cases, too, may probably be hæmatogenous. As shown in a previous paper, there is, however, as to clinical aspect and course, such a difference between these two groups of conjunctival tuberculosis, that the desire to view each group by itself and to compare them with each other, is quite natural.

Since I had the opportunity of examining and treating the comparatively large number of 48 cases I confine myself to the discussion of this material which is large enough to throw some light on the most important points of this question. I have refrained from comparing it with the cases previously reported in literature because an exact statistical compilation would be very difficult since the details given in the several cases are often very incomplete.

Of the 48 patients 19 had no lupus of the skin, the other 29 had lupus.

Of the 19 with primary conjunctival tuberculosis 17 had no tuberculosis in any other part of the body, not even in the nasal cavities; in no case was the lacrimal apparatus affected. One had undoubted and the other doubtful lupus of the nasal mucous membrane. Of the 17 apparently primary cases 13 were females, 4 males. There were 2 between 1 and 5, 3 between 6 and 10, 4 between 11 and 15 and 8 between 16 and 20 years old. None was older than 20 years. All the cases were monolateral. In one case there was tuberculosis of the bulbar conjunctiva (the palpebral conjunctiva was also affected), in the others only the pal-

*Klin. Mtsbl. f. Augenhlk., Vol. LV, p. 97.

pebral conjunctiva was diseased. Regarding the exact locality in the affected lid, our notes are incomplete. Of the remaining 15, 9 were left-sided and 6 right-sided. The upper lid was affected 11 times, the lower one twice, and both twice. In all of the 15 cases a decided swelling of the preauricular lymph gland was found often combined with swelling of the submaxillary and retromaxillary ones. These latter never suppurated while the preauricular gland which showed signs of suppuration, had to be incised and scraped in 12 cases.

One of the two cases with lupus of the nasal mucous membrane showed no swelling of the lymph glands, while in the other, in which the microscopical examination left the diagnosis of lupus doubtful, such a swelling was present.

Of the 29 lupus patients with conjunctival tuberculosis, 28 had lupus of the face, one of them was apparently healed. In 6 the lacrimal apparatus was diseased and 4 of these had lupus of the nasal mucous membrane; 8 had lupus in the nose without affection of the lacrimal apparatus. Of the 29 cases I shall use only 28 in the following compilation, since in one case the affection of the conjunctiva was due to a wound in the canaliculus which had been slit on account of dakryocystitis. Of the 28, 22 were females, 6 males. These must, of course, be considered in relation with the number of female and male lupus patients who came to the Finsen Light Institute during the same time. This was, up to March 1, 1915, 2158 Danes and foreigners; since, however, the foreign material is rather accidental, we shall consider only the Danish patients with a total of 1992, 516 males and 1476 females. Of the 28 patients with conjunctival tuberculosis 5 were foreigners (2 males and 3 females). This leaves 23 Danes, 4 males and 19 females, that is 0.78 per cent. and 1.29 per cent. As to ages there was none up to 6 years, one between 6 and 10, 4 between 11 and 15, 6 between 16 and 20, 4 between 21 and 25, 6 between 26 and 30, 3 between 31 and 35, 1 between 36 and 40, as also between 41 and 45 and 46 and 50, and 1 52 years old. Of these 28 cases 9 were left-sided, 11 right-sided and 8 double-sided. Leaving the one case of tuberculosis of the bulbar conjunctiva unconsidered there remain 35 affected eyes; the disease was in the upper lid 18 times, in the lower lid 15 times, and in both lids twice. There were, however, 10 cases in which the disease had grown over from the skin per continuation. If we leave these off there remain 5 left-sided, 9 right-sided and 5 double-sided.

Thus 23 eyes were affected, or if we leave off the case of

tuberculosis of the bulbar conjunctiva, as above, there are 22 cases, 13 in the upper and 8 in the lower lid and one in both lids.

Only 2 of the 28 cases showed signs of a swelling of the preauricular lymph gland; in both cases it was the size of a pea, was indolent and not different from any other accidental swelling.

Let us resume. The so-called *primary conjunctival tuberculosis* develops exclusively in young individuals (below 20 years); the frequency rises equally from the first five years to those between 16 and 20. The female sex is much more frequently affected than the male sex. The affection is always monolateral, the left eye being affected a little more frequently than the right. The upper eyelid is attacked oftener than the lower one. There is always swelling of the lymph gland and often suppuration.

The *conjunctival tuberculosis in lupus patients* has spared the first 5 years of life, but it was found up to 52 years. It seems most frequent between 26 and 30 years, but the age differences are not well defined. The female sex is attacked a little more frequently than the male, but the difference is very small and may be accidental. The affection is not infrequently bilateral, the left and the right eye are affected about with the same frequency; at least, if the cases in which the other eye became later on affected, are, also, counted. If these are excluded the right eye was affected more often than the left. The upper eyelid is diseased more frequently than the lower lid, although by far not as frequently as in the primary form. It is doubtful whether swelling of the lymph glands occurs, at any rate there is never any suppuration.

These differences may be due to various causes. Aside from the possibilities of infection found in patients with lupus of the skin, the virulence of the tubercle bacilli and their presence in larger or smaller numbers may obviously play a certain role. We must not forget that it is usually very difficult to find tubercle bacilli with the microscope in lupus tissue, because only few are present in lupus and they do not stain as well. Yet it is not possible to explain all conditions.

As regards the clinical picture of lupus of the conjunctiva, the subjective symptoms are often very inconspicuous. The patient may carry his affection about with him for a long time before he is aware of it. There is just a little swelling of the eyelid and a minimum of secretion. The affection shows itself in the mucous membrane mostly by coarsely granulating, easily bleeding ulcera-

tions and comb- or mushroom-like excrescences, and at the very first examination scars are often found.

In the primary form the first symptom which the patient and those about him observe is often the swelling of the preauricular glands, with sometimes at the same time and sometimes later on swelling of the glands in the neighborhood, the submaxillary and retromaxillary glands. It is not rare to find this symptom before anything abnormal is seen in the conjunctiva and it is not at all uncommon that the patient or his relatives state that first the gland in front of the ear was diseased and that from this the disease wandered to the eye. It has also happened that a patient came for examination with conjunctival tuberculosis, after having been treated by a physician for alleged parotitis who had never noticed anything abnormal about the eye.

In many cases only later symptoms appear in the eyes which the patients recognize and when these have reached a certain height the lid is plainly seen to be swollen; it is (usually the upper one) red, tense and can become so swollen that the globe is perfectly hidden. There is lacrimation and some secretion, but not an excessive amount. The bulbar conjunctiva shows a medium degree of injection and the affected portion of the palpebral conjunctiva is considerably thickened and studded with miliary nodules, granular formations which recall lymph follicles. In one single place often one or more irregular ulcerations may be found, their floor covered with a gray secretion.

It is possible but not the rule that during the treatment the affection may later on assume an aspect similar to lupus and this is of no further importance.

Yet, whoever has seen these cases, must feel that their peculiarities are more easily understood by assuming their origin to be endogenous from the blood—or lymph—vessels, than to be ectogenous. The early and constant swelling of the lymph glands is then explained more easily, as, also, the nearly constant miliary aspect and it is easier of comprehension to look upon the ulcerations as secondary than to assume the miliary dissemination as secondary.

As is known, Rhein, for instance, has described cases of conjunctival tuberculosis looking like trachoma, and looked upon them as of endogenous origin, but it seems as if the ulcerative cases, also, as a rule show such a character in part. From different communications in literature the ideas are exaggerated as to the importance which is played by tuberculosis of the nasal

cavities and the lacrimal apparatus as the starting point for a tuberculous infection of the conjunctiva. In this connection it is interesting that in none of the 19 cases any affection of the lacrimal apparatus was present; and lupus of the nasal cavity was found with certainty only once and this in a case in which the lymph glands were not affected, and in one other case, in which there was swelling of the lymph glands.

On the other hand cases have been observed at the Finsen Light Institute in which tuberculous affections of the lacrimal apparatus caused through perforations a skin tuberculosis, yet never one which infected the conjunctiva, which is remarkably resistant to ectogenous tuberculous infection.*

My opinion that the lupus conjunctivitis is probably of ectogenous origin is not based alone on its difference in aspect from the primary tubercular conjunctivitis and because the lymph glands are left intact, which can be otherwise explained, but because on the one hand the cases developed per continuation from the skin are very similar to those developed in another way, and on the other because the starting point of an ectogenous infection is easily comprehensible, and on account of the ease with which the infection takes root in a mucous membrane which has been prepared by repeated attacks of conjunctivitis, blepharitis, etc.

When inquiring whether the differences found in the above statistical compilation support this assumption, we must answer that the appearance of primary conjunctival tuberculosis exclusively in youth corresponds with the appearance of surgical tuberculosis. That the female sex is affected much more frequently than the male does in no way argue against an endogenous origin, since both sexes are attacked by surgical tuberculosis, also, with varying frequency, although here the male sex predominates.‡

Since all ages and both sexes were affected by ectogenous lupus conjunctivitis with about the same frequency, the fact that only the earliest periods of life and especially the female sex are attacked by the so-called primary conjunctival tuberculosis speaks against its being of ectogenous origin.

That the left eye is more often affected than the right one,

*Klin. Mtsbl. f. Augenhlk., 1909, p. 336.

‡Tuberculous coxitis may occur at any age, but is most frequent between 2 and 18, and here between 5 and 10 years. The male sex is affected twice as often as the female. Koenig states that of 704 patients with tubercular arthritis of the knee 292 were of the first decade, 190 of the second, and 93 of the third, and that 59.4 per cent. were males and 40.6 per cent. females (*Hdb. d prakt. Chir.*, Stuttgart, 1914, Enke).

according to general opinion, speaks against an ectogenous infection, and this opinion seems to be upheld by the fact that lupus of the conjunctiva more often attacks the right eye.

As to the prognosis of conjunctival tuberculosis I want to remark that this is much more favorable than is usually believed in any case in which the Finsen Light treatment is employed. All of the primary cases, mentioned above, were cured without loss of function. Among the lupus cases there were a few in which this treatment could not be carried out on account of lupus changes in the surroundings of the eye or on account of shrinkage of the tissues.

However, it cannot be doubted that Finsen's treatment of conjunctival tuberculosis is superior to all other methods and if some cases are reported in literature in which it was unsuccessful, the cause was probably a faulty technique.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. F. Hardy, M.D.,
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CONCERNING CERTAIN POST-OPERATIVE AND POST-TRAUMATIC OCULAR COMPLICATIONS AND THEIR TREATMENT.

DeSchweinitz (*Therapeutic Gazette*, September 15, 1915), in a rather lengthy article, reviews a number of well known conditions following operation and trauma and the remedial agents, giving in the main the results of his individual experience. The points touched upon are: (1) Certain types of post-operative glaucoma. (2) Periodicity in uveal tract inflammations of traumatic origin. (3) Recurring hyphæma after cataract extraction. (4) Post-operative and post-traumatic loss of vitreus. (5) Post-operative suppurative infections. (6) Post-operative delirium. (7) Post-operative inflammations in gouty subjects. (8) Infections after penetrating foreign body injuries. (9) The use of conjunctival flaps. (10) Treatment of traumatic iridocyclitis.

Concerning (1) attention is directed to the glaucoma following cataract extraction, and especially to that raised tension which follows delayed restoration of the anterior chamber. DeSchweinitz does not agree with those who advocate that the eye be kept under a dressing until restoration of the anterior chamber takes place. Search should be made for possible incurvation of the flap; also resort may be had to cauterization of the entire length of the wound with carbolic acid or a pencil of silver nitrate. The usual cause is entanglement of some tissue between the lips of the wound. Supervening glaucoma has been met with by the author five times.

(2) Reference is made to the seeming periodicity at times of iritis, sometimes associated with hypopyon, and to similar uveal affections responding favorably to quinine. This periodicity has been noticed also in cases of traumatic iridocyclitis. DeSchweinitz urges the administration of quinine in such cases irrespective of the blood examination. No positive reason can be given for the beneficial effects resulting from quinine unless it be due to an increased phagocytic power of the blood. Quinine is recommended in long drawn out uveal tract inflammations, especially those of the iris and ciliary body of traumatic origin.

(3) Recurring hypæmia was met by the author five times, each time following cataract extraction, three with and two without iridectomy. All ultimately recovered. There was no trauma or blood dyscrasia. All remedies were tried, and finally it was thought that calcium salts were of distinct advantage inasmuch as the complication ceased after their administration.

(4) DeSchweinitz does not view with unconcern a loss of vitreus even slight. Where a free escape of vitreus occurs, filling the globe with physiological salt solution is recommended. If a large flap has been made it may be well to take a stitch, thereby preventing further vitreus loss. For the opacities of the vitreus which frequently follow, syrup of hydriodic acid is recommended, beginning with a drachm three times a day and gradually increasing to four drachms three times a day, well diluted and after meals. This is given in place of the usual idodides.

(5) The treatment of post-operative infections is unsatisfactory. Usually only mild infections respond, such as marked œdema of the bulbar conjunctiva, gray infiltration of the line of the incision, thickening and discoloration of the iris and a gray, sometimes puriform, exudation in the pupil space, and not infrequently hypopyon. Cauterization may be employed, the

author preferring carbolic acid the value of which is not due solely to its germicidal power. Repeated drainage of the anterior chamber formerly advocated by H. Knapp, may be used coupled with an attempt to sterilize the anterior chamber either with irrigations or drugs (iodoform) introduced into the chamber. Urotropin internally may be of service. DeSchweinitz accords to subconjunctival injections but little virtue—an opinion widely at variance with some other observers. Lastly, vaccines are considered. Stock vaccines are thought to do little good except where repair and recovery have already commenced, when they may give an added impetus. Better results come from autogenous vaccines.

(6) Delirium following operation is not uncommon and may be the result of suppressed excitement, bandaging of both eyes, the result of drugs, especially atropine in the operated eye, and finally, according to the theory of Fromaget, that the delirium is due to an autoinfection depending upon uræmia or upon the absorption of toxins from the intestines. As to treatment, hyoscine gr. 1/150 or 1/200 hypodermically is advised. Paraldehyde is also mentioned.

(7) Hidden, latent or focal infections may defeat an otherwise smooth and perfect cataract extraction; gout of the type denominated retrocedent may be an exiciting cause. A latent gonorrhœa (gleet) may likewise prove disastrous. Both these complications were exemplified and a detailed description given of them.

(8) Foreign body injuries may not be seen till infection has set in, or it may not develop until after a foreign body has been removed. The author evacuates the purulent material from the anterior chamber and expresses the lens if injured. The chamber is washed out with salt solution. These irrigations may be repeated and be copious. Collargol and iodoform rods have also been used in the anterior chamber.

(9) The author has confidence in a flap of conjunctiva to cover a large gaping corneal or scleral wound, provided it is so placed that the sutures themselves do not overlie the wound. Circumcising the cornea, gathering the edge of conjunctiva in a purse string suture and covering the entire cornea with conjunctiva, leaving it thus for a week, may be used in large and extensive corneal wounds. In the ordinary flap operation DeSchweinitz paints the line of sutures with a 5 per cent. solution of iodine. Equally good is Whitehead's varnish composed of iodoform

1 part, compound tincture of benzoin 6 parts; to be made with ether. This varnish may also be used along the line of sutures in a lid operation, thereby dispensing with dressings and bandage.

(10) To prevent or combat infection in traumatic iridocyclitis, cold may be applied, constantly the author says and not at intervals as is usually done. Swelling coming on after the use of cold or pain supervening, points to a congestion of the sinuses and must be discontinued. Hot compresses in these circumstances are thought not to be advisable, and especially so if there is an actual purulent inflammation. They are held to be of no benefit even when the condition is a non-suppurative one. Mercury is a most valuable agent; some prefer inunctions, the author calomel sufficient to produce a constitutional impression, but not purgation. Mercury is followed with salicylates or even combined. How salicylates act is unknown. They are given empirically in sympathetic ophthalmia. Large doses are given; 80 grains the first 24 hours, 60 grains the second and 40 grains the third, are recommended. The observation is made that if salicylate administration is followed by violent tinnitus early the favorable effects of the drug are not so manifest as if gastric and aural symptoms do not occur.

Lymphagogues and analgesics are given their place. Dionin is begun in weak solutions and raised finally to 10 per cent. In using mydriatics, there is claimed a distinct advantage in using scopolamine in addition to atropine. Dionin combined with holocain is said to be more effective than dionin alone.

SWIMMING POOL CONJUNCTIVITIS.

For several years attention has been sporadically called to a type of conjunctivitis resulting from infection from swimming pools. The most recent article is by Gradle (*Ill. Med. Jour.*, February, 1916). Originally it was an infection thought to resemble trachoma, but that is not the present view. An interesting finding is that of bodies microscopically identical with the inclusion bodies of Prowaczek.

Brown, of Philadelphia, reported a series of 500 cases occurring in that city in 1914. Corneal complications except in one case were missing, and this one was thought to be due to secondary infection. The cases of Brown are thought to be of a different character from those earlier reported from Berlin. Gradle saw 18 cases in 1914-15, and made smears, staining for

all the bacteria usually found in the conjunctival sacs. None were found that would account for the clinical picture present. Cell inclusion bodies were always found except where silver nitrate had been used.

The disease is usually bilateral; clinically, the picture is as follows: Moderate photophobia—small amount of muco-purulent secretion particularly at night. Moderate œdema of the lids. Tarsal conjunctiva slightly swollen and roughened. Coarse injection with individual vessels standing out prominently. No distinct hyperplasia of follicles. Conjunctiva of the transitional folds more swollen, with a smoother surface and deeper red color. Bulbar conjunctiva slightly œdematous and swollen. Moderate coarse injection beginning at the transitional folds and decreasing towards the cornea. Limbus is surrounded by a zone of normal appearing conjunctiva, cornea normal.

Under treatment the disease lessens in a week and usually disappears in three weeks. It is apt to remain longest in the transitional folds. If treatment is discontinued too soon a relapse may occur. Gradle applies 1 per cent. silver nitrate once a day, and prescribes 10 per cent. argyrol to be used three times a day. In one case the disease persisted for over six months. The inclusion bodies rapidly disappear under treatment. It cannot be positively said whether these cell inclusions are ætiological factors or not.

BOOK REVIEWS.

DISEASES OF THE EYE. A Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. deSchweinitz, A.M., M.D. With 300 illustrations and seven chromo-lithographic plates. Seventh Edition, thoroughly revised. W. B. Saunders Co., Philadelphia and London, 1913. Price, $5.00 net. half morocco $6.00 net.

Although this excellent book had been received in 1913, it had by some mishap been mislaid and therefore not been mentioned in our reviews before this.

deSchweinitz's text-book is one of the best and one of the best known. There is not much to be added to the appreciation with which we have spoken of the previous editions. That this seventh one has been added to by a number of paragraphs in

which more recent additions to our knowledge are contained, needs hardly to be pointed out. The illustrations are thoroughly good and to the point. The large type in which the book is printed makes it easy to read, which is very commendable, even if it adds to the weight of the book.

THIRD ANNUAL REPORT ON THE OPHTHALMIC SECTION, DEPARTMENT OF PUBLIC HEALTH, EGYPT, 1914. By the Director of Ophthalmic Hospitals, Cairo. Government Press, 1915. Price, P.T. 10.

This is the report of a further year's activity of Dr. A. F. MacCallan's highly successful corps of ophthalmic workers in Egypt. It describes the additional eye hospitals, both permanent and travelling, and the work done in them. Cataract extraction and glaucoma and their operations are discussed, as, also, the germs found in cases of acute conjunctivitis. The activity of several germs in relation to the temperature is detailed at some length and the curves are given. As is natural, trachoma and its treatment, also, occupies some space, though very much less than in former reports. Then follow chapters on ophthalmic inspection of schools and on blindness in Egypt. General statistical tables finish this interesting report on Dr. MacCallan's very efficient and valuable work. ALT.

PAINLESS CHILDBIRTH—Eucotia and Nitrous Oxid-oxygen Analgesia. By Carl Henry Davis, A.B., M.D. Chicago. Forbes & Co., 1906. Price $1.00.

The book is carefully prepared and well written. Every page reveals the author to be master of his subject. In the context is found much that is not suggested by the title Dämmerschlaf as produced by the drug method. This is shown to be a cross between mesmerism and intoxication. The argument for the employment of nitrous oxide-oxygen in labor shows this method to surpass any now in use. The two objections that have heretofore prevented its more extensive use, namely, its cost and the necessity for the services of one skilled in its use, have been nearly overcome by the use of improved apparatus and the tendency toward the pregnant woman going to a maternity home to be confined. This makes it easy to procure the instrument and the person sufficiently skilled to use the same. Further, the author shows that with certain instruments the patient herself can administer the gas. J. ROSS CLARK.